

REMARKS

In the Office Action mailed April 22, 2004, the Examiner objected to claims 7-9, 11, 38, 39 and 41 for failure to further limit the preceding claims. Specifically, the Examiner asserted that the method limitations of claims 7-9, 11, 38, 39 and 41 did not further limit the preceding apparatus claims. The Examiner further rejected claims 1-15 and 31-42 under 35 U.S.C. §103(a) as being unpatentable over Hicks in view of Ward et al.

The Office Action states that only claims 1-15 and 31-42 are in the case. As can be seen from the forgoing objections and rejections, the Examiner only examined claims 1-15 and 31-42. However, in a Preliminary Amendment filed by Applicant's attorney on January 5, 2004, Applicant cancelled claims 16-30 and added claims 31-45. Accordingly, claims 1-15 and 31-45 are actually in the case. It appears that claims 43-45 have not yet been examined. Consideration of claims 43-45 is respectfully requested.

By this paper, claims 1-10, 12, 31 and 37-40 have been amended to more particularly point out and distinctly claim the novel and unobvious subject matter of the present invention. Claims 13-15 have been cancelled. Applicant asserts that all pending claims are in condition for allowance. In view of the following remarks, reconsideration of all pending claims is respectfully requested.

OBJECTION TO CLAIMS 7-9, 11, 38, 39 and 41

The Office Action objected to Claims 7-9, 11, 38, 39 and 41 for failure to further limit the preceding claims. Specifically, the Examiner asserted that the method limitations of claims 7-9, 11, 38, 39 and 41 did not further limit the preceding apparatus claims.

By this paper, claims 2-10, 31 and 38-40 have been amended to provide the antecedent basis for affirmatively reciting reactant chemicals and carrier fluids. Accordingly, any limitation on how the reactant chemicals react (*e.g.*, react to form chlorine gas) or on the nature of the carrier fluid

becomes a physical limitation on their composition. Reconsideration is therefore respectfully requested.

REJECTION OF CLAIMS 1-15 AND 31-42 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER HICKS IN VIEW OF WARD ET AL.

Claims 1-15 and 31-42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hicks in view of Ward et al. The Examiner asserts that Ward et al. provides the metering means that is lacking in Hicks. Moreover, the Examiner asserts that Ward et al. implies control over the metering means and that it would have been obvious to for this control to be synchronized control.

As appreciated, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. (*See*, MPEP 2143.)

In the present case, the combination of Hicks and Ward et al. fails to established at least two of the above-listed basic criteria necessary for establishing a prima facie case of obviousness. First, there is no motivation or suggestion to combine Hicks and Ward et al. because applying the metering means of Ward et al. to the generator of Hicks would render the generator of Hicks unsuitable for its intended purpose. Second, the combination of Hicks and Ward et al. fails to teach or suggest all of Applicant's claim limitations. Specifically, the combination of Hicks and Ward et al. fails to teach or suggest a synchronizer. Accordingly, a rejection over Hicks in view of Ward et al. under 35 U.S.C. §103(a) is improper.

With respect to the first missing criteria for prima facie obviousness, it is well established that, if a proposed modification would render the prior art invention being modified unsatisfactory

for its intended purpose, then there is no suggestion or motivation to make the proposed modification. (*See*, MPEP 2143.01.) Incorporating the metering means of Ward into Hicks et al. renders the generator of Hicks unsatisfactory for its intended purpose. As a result, there can be no motivation or suggestion to combine Hicks and Ward et al. and the case for prima facie obviousness fails.

For example, in the Background Section of Hicks, Hicks lists the prior art's use of chemical feed pumps to meter raw materials as a disadvantage. (*See*, Hicks at column 1, lines 42-43.) To eliminate the need for metering pumps, Hicks teaches an eductor 11 containing a venturi 63. (*See*, Hicks at column 3, lines 21-33.) The eductor, as taught by Hicks, produces a vacuum that draws the reactant chemicals into the reaction site. (*See*, Hicks at column 6, line 50 through column 7, line 68.) As would be expected in a device relying exclusively on eduction for reactant movement, "if the vacuum power source stops or the line is broken all chlorine dioxide generation stops." (*See*, Hicks at column 4, lines 22-25.) This automatic shut-off allows Hicks to accomplish its stated purpose of providing "a substantially safe chlorine dioxide generation system that avoids large build ups of undiluted [chlorine dioxide]." (*See*, Hicks at column 2, lines 20-22.)

Ward et al., on the other hand, requires metering means such as "conventional, gas, electric or gravity-type flow-regulating pumping system." (*See*, Ward et al. at column 3, lines 40-46.) That is, Ward et al. specifically teaches what Hicks teaches against. By forcing the metering means of Ward et al. onto the generator of Hicks, which has no need for them, the generator of Hicks would no longer be suitable for its stated purpose of "educt[ing] both the sodium chlorite and chlorine gas at the same time" to "[avoid] over production of chlorine dioxide which could result in an explosion." (*See*, Hicks at column 4, lines 21-26.) Accordingly, there is no suggestion or motivation to make the proposed modification.

With respect to the second missing criteria for prima facie obviousness, the combination of Hicks and Ward et al. fails to teach or suggest all of Applicant's claim limitations. Specifically, the combination does not teach or suggest a synchronizer.

In asserting the contrary, the Examiner articulates at least two unsupportable assumptions. First, the Examiner assumes that a synchronizer is identical to a repeat cycle timer. That is not the case. A synchronizer encompasses a much broader range than does a repeat cycle timer. The Examiner's assertion is akin to asserting that a fruit is equivalent to an apple. While all apples are fruits, there are many fruits that are not apples. The two terms are not equivalent. In this same regard, a similar relationship exists between a synchronizer and a repeat cycle timer.

Second, the Examiner errs in assuming that a teaching of "metering means" by Ward et al. can be stretched to become a teaching or suggestion of a synchronizer controlling a plurality of metering pumps to synchronize the pulsations of each metering pump, as required by Applicant's invention. Notably, neither Hicks nor Ward et al. make any mention of metering pumps operating under the direction of a controller. Furthermore, it does not follow that any controller that may be implied by Ward et al. would obviously be a synchronizer. A controller can insure that a metering means provides "predetermined amounts or rates of flow," as taught by Ward et al., without coming close to being a synchronizer. Moreover, neither Hicks nor Ward et al. makes any mention of why a synchronizer would be advantageous. It is only Applicant who has recognized the benefits of including a synchronizer.

In operation, many metering pumps, by the very nature of their manner of operation, are unable to provide a constant flow. Much like a human heart, they act in a cyclical manner. During a stroke of such metering pumps, there is a volumetric surge of flow. As the pumps recover and prepare (*e.g.*, load) for the next stroke, there is an ebb in the flow. Thus, a pulse is created.

Like two human hearts, two metering pumps may pump identical "predetermined amounts or rates of flow" without being synchronized. A metering pump having a bigger stroke occurring

less often may produce the same amounts or rates of flow as another metering pump having a smaller stroke occurring more often. The two pumps may begin pumping and end pumping at the same time, but they are not synchronized. By synchronizing the pulses of the metering pumps, the natural volumetric surges may be timed to occur at the same time. Accordingly, while the flow of the reactants from the various metering pumps may vary in a cyclical pattern, a synchronizer insures that they vary in parallel to maintain optimal reaction efficiency.

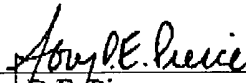
Ward et al. never recognizes that some metering pumps operate in a cyclical, pulsing manner. Furthermore, Ward et al. never recognizes the effect that this pulsing may have on reaction efficiency. Accordingly, Ward et al. provides no solution to the problem that could possibly, either alone or in combination with Hicks, teach or suggest Applicant's claimed synchronizer. Based on the teachings and disclosure of the issued patent, Ward et al. is perfectly content to teach metering means that deliver reactants at stated rates of "3 GPM," "1.5 GPM," etc. without any mention or suggestion of how flow may vary during the specified gallon-per-minute flow. (*See*, Ward et al. at column 6, lines 18-23 and column 7, lines 56-63.)

As the foregoing demonstrates, none of the references cited in the Office Action, either alone or in combination, disclose, teach, suggest or make obvious the particular combination of elements which comprise Applicant's invention, as claimed. It is respectfully requested that the Examiner reconsider and withdraw the above rejection to claims 1-12 and 16-42. Consistent with the foregoing, Applicant respectfully asserts that claims 1-12 and 16-45 are in condition for immediate allowance.

In the event that the Examiner finds any remaining impediment to the prompt allowance of any of these claims which could be clarified in a telephone conference, the Examiner is respectfully urged to initiate the same with the undersigned.

DATED this 12th day of July, 2004.

Respectfully submitted,



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